2.9 CALTRANS Cells and Cell Libraries

A. Cells

Cells are small 2D drawings, complex elements or standard notes identified by name. They provide uniformity and eliminate the need for each designer/delineator to take the time to redraw frequently used items. The drop element tool can be used to disassociate the graphical elements in a cell from their group so that the elements can be edited.

When a cell is placed, the cell origin will be located at the selected data point. The origin point is defined when the cell is created.

Some specific uses of cells include:

- Terminator: used at the beginning or end of a line or arc
- Pattern: used repeatedly throughout an area or along a line or arc
- Plan sheet creation: for example, standard borders, tables, grids, notes, symbols, etc.

B. Types of Cells

Two types of cells are utilized by Caltrans, point and graphic. The attributes (level, color, line style and weight) of a point cell are determined at the time the cell is placed by taking on the active settings. The attributes of a graphic cell are determined when the cell was created, and is independent of the active settings. The attributes of a graphic cell created on the default level takes on the active level when placed but takes on the active color, line style or weight only if ByLevel is defined for any of those attributes. A graphic cell rotates when a view is rotated, while a point cell is view-independent. A graphic cell created on the default level acts like a graphic cell when the view is rotated.

Cell Type Comparison for Caltrans Standard Cells

	Point	**Graphic**	**Graphic created on Default Level**
Level	placed on active level	level independent	placed on active level
Rotation	view independent	view dependent	view dependent
Snap	to cell origin	to key points	to key points
color	active color when placed	set when created	active color when placed
line style, weight	active settings when placed	set when created	set when created

C. Cell Libraries

Standard cells are stored in a design file called a cell library that is available to all users. Cell libraries make it easy to update and add standard cells. Cells in each standard Caltrans cell library are listed and shown in the appendices.

Caltrans Standard Cell Libraries

Discipline	File Name
Roadway (numbered levels)	CTCELLIB.cel
Roadway (named levels)	CTCELLIB_NamedLevels.cel
Right of Way (numbered levels)	RWEnglish.cel
Right of Way (named levels)	Ct_RW_NamedLevels.cel
Topographic (named levels)	Ct_Topo_NamedLevles.cel
Structure Bridge Design (numbered levels)	Stcel_english.cel

Districts and some functional units within various districts may have their own cell libraries for local agency standards or standards unique to a certain functional unit. Districts or individuals should not recreate or copy cells that are already in one of the Caltrans standard cell libraries.

The roadway cell library for numbered levels (CTCELLIB.cel) includes cells for the following eight (8) functional units:

- Project Plans
- Roadway Design
- Landscape Architecture
- Traffic Electrical Systems
- Right of Way for Roadway projects*
- Photogrammetry
- Surveys
- Water Pollution Control

*The cells in CTCELLIB.cel for Right of Way are used by Design to depict right of way features on project plans. Right of Way Engineering has a cell library (RWEnglish.cel) for producing Right of Way map products and is not used for roadway project plans.

The roadway cell library for named levels (CTCELLIB _NamedLevels.cel) includes cells for the following six (6) functional units.

- Project Plans
- Roadway Design
- Landscape Architecture
- Traffic Electrical Systems

- Water Pollution Control
- Utilities

Right of way and survey cells are not included in CTCELLIB _NamedLevels.cel. There are separate named level cell libraries for Right of Way Engineering and topographic maps. The topographic named level cell libraries include four (4) separate cells with the same graphical representation for each item, but each cell is placed on one of four (4) separate named levels depending on the data collection method (i.e., photogrammetry, survey, mobile LIDAR or aerial LIDAR).

If “display all cells in path” is checked on in the cell library dialog, all of the cells in all of the cell libraries listed in the dialog box File drop down menu are listed together, in addition to the cells in the attached cell library. This is useful, for example, because Caltrans standard roadway cells and right-of-way cells are in separate libraries.

Cell selectors allow users to find and place cells from a pre-selected group of related cells using a customized dialog. A cell selector can contain cells from more than one cell library.

D. Cells and Conventional Levels

Most Caltrans cells are graphic cells which means that the functional unit that created the cell has predetermined the level, color, line style and weight. Because Caltrans has two separate standard level conventions (i.e., numbered levels and named levels), Caltrans also has separate cell libraries to work with each level convention. For example, cells in both the CTCELLIB _NamedLevels.cel cell library and the CTCELLIB.cel cell library have the same graphics but use different levels. Before placing a cell, it’s a good habit to verify that the desired cell library is attached to the active file, depending on which levels you want to use.

E. Cells and Plot Scale

Cells must be sized proportionally for the intended plot scale of the drawing. All cells in Caltrans cell libraries are sized for use at the Caltrans base plot scale of 1” = 50’ using the MicroStation active scale set to 1 when placing a cell.

The formula for active scale setting for a different intended plot scale is:

$$active\ scale\ setting = \frac{intended\ plot\ scale}{cell\ library\ file\ base\ plot\ scale}$$

Therefore the active scale setting for placing a cell for the intended plot scale of 1”=20’ is:

$$active\ scale\ setting = \frac{20}{50} = 0.4$$

Active Scale Setting for Placing a Cell

Caltrans Standard Plot Scale	Active Scale Setting for Placing Cell
1”=20’	0.4
1”=50’	1.0
1”=100’	2.0

Line style scale for placing Caltrans custom line styles is different than the active scale for cell placement (see Section 2.7 E for more information).

F. Cell Features and Options Not Used by CALTRANS

Relative: If the active cell is a graphic cell and “Relative” is turned on, the element with the lowest level in the cell is placed on the active level and elements on higher levels in the cell are placed on levels relative to the active level.

Interactive: Allows a cell to be interactively scaled to any size.

Shared Cells: The first time a cell is placed in a design file, the cell library in which it is stored must be attached. If the cell is placed as a shared cell, it is not necessary to have the cell library attached to place additional instances of that cell. All instances of a shared cell in the design file are replaced when any instance of that shared cell is replaced using the Replace Cells tool. The location of shared cells can be associated with points on other elements if Association Lock is on.